REMARKS

Claims 1 to 27, 30 to 33, 40 and 42 to 79 are pending.

New claim 61 and its dependent claims are based on dependent claims 13 and 14, the specification page 7, lines 13 to 14 and the Examples. Similarly, the amendment to claim 22 is based on claim 29, which was indicated to be allowable over the art. The new claims 42 to 60 are based on claims already in the case. Claims 28, 29, 34 to 39 and 41 are canceled without prejudice or disclaimer.

The claims have been amended to overcome the objections based on "(III)."

Claims 1 to 33 were rejected under 35 U.S.C. §112, first paragraph. The Office Action states:

> However, absent is the intended goal that would be achieved through the implementation of the instantly claimed method. For instance after "a second population of entities" is identified: 1) what does the information represent/mean? 2) what distinguishes the "first population of mixture entities" from the "second population of mixture entities"?; 3) what does one do with the information? 4) what criteria(s) establishes the identification of a "second population of mixture entities" as a "favorable combination" or a "fit solution/entity

However, this passage is preceded in the Office Action by an acknowledgement of the "goals" of the invention method, meanings of the information, distinctions between a first population of mixtures," how the genetic algorithm (GA) information is used and the standards that can be used to select a next population. The Office Action at page 3 acknowledges that the instant specification teaches:

> Genetic algorithms are computer programs that solve search or optimization problems by simulating the process of evolution by natural selection. Regardless of the exact nature of the problem being solved, a typical genetic algorithm cycles through a series of steps that can be as follows:
>
> (1) Initialization: A population of potential solutions is generated. "Solutions" are discrete pieces of data that have the general shape (e.g., the same number of variables) as the answer to the problem being solved. For example, if the problem being considered is to find the best six

coefficients to be plugged into a large empirical equation, each solution will be in the form of a set of six numbers, or in other words a 1X6 matrix or linked list. These solutions can be easily handled by a digital computer.

(2) Rating: A problem-specific evaluation function is applied to each solution in the population, so that the relative acceptability of the various solutions can be assessed.

(3) Selection of parents: Solutions are selected to be used as parents of the next generation of solutions. Typically, as many parents are chosen as there are members in the initial population. The chance that a solution will be chosen to be a parent is related to the results of the evaluation of that solution: better solutions are more likely to be chosen as parents. Usually, the better solutions are chosen as parents multiple times, so that they will be the parents of multiple new solutions, while the poorer solutions are not chosen at all.

(4) Pairing of parents: The parent solutions are formed into pairs. The pairs are often formed at random but in some implementations dissimilar parents are matched to promote diversity in the children.

(5) Generation of children: Each pair of parent solutions is used to produce two new children. Either a mutation operator is applied to each parent separately to yield one child from each parent or the two parents are combined using a recombination operator, producing two children which each have some similarity to both parents. To take the six-variable example, one simple recombination technique would be to have the solutions in each pair merely trade their last three variables, thus creating two new solutions (and the original parent solutions may be allowed to survive). Thus, a child population the same size as the original population is produced. The use of recombination operators is a key difference between genetic algorithms and other optimization or search techniques. Recombination operating generation after generation ultimately combines the "building blocks" of the optimal solution that have been discovered by successful members of the evolving population into one individual. In addition to recombination techniques, mutation operators work by making a random change to a randomly selected component of the parent.

(6) Rating of children: The members of the new child population are evaluated. Since the children are modifications of the better solutions from the preceding population, some of the children may have better ratings than any of the parental solutions.

(7) Combining the populations: The child population is combined with the original parent population to produce a new population. One way to do this is to accept the best half of the solutions from the union of the child population and the source population. Thus, the total number of solutions stays the same but the average rating can be expected to

> improve if superior children were produced. Any inferior children that were produced will be lost at this stage. Superior children become the parents of the next generation.
>
> (8) Checking for termination: If the program is not finished, steps 3 through 7 are repeated. The program can end if a satisfactory solution (i.e., a solution with an acceptable rating) has been generated. More often, the program is ended when either a predetermined number of iterations has been completed, or when the average evaluation of the population has not improved after a large number of iterations.
>
> The present invention is directed to the application of genetic algorithms to HTS methodology, particularly for materials systems. Because the number of constraints for a materials system can be quite large, the number of combinations of constraints may be a very large number. In lieu of physical evaluation of each combination of constraints, a genetic algorithm is applied to a population of constraints to define a second population of constraints that is a generation of the first. The genetic algorithm then searches for favorable combinations of constraints to produce a materials system that meets specified criteria. The algorithm "short cuts" the investigatory process by avoiding exhaustive sequential population testing.
>
> The invention can be applied to screen for a catalyst to prepare, e.g., a diaryl carbonate by carbonylation. Diaryl carbonates such as diphenyl carbonate can be prepared by reaction of hydroxyaromatic compounds such as phenol with oxygen and carbon monoxide in the presence of a catalyst composition comprising a Group VIIIB metal such as palladium or a compound thereof and a halide source such as a quaternary ammonium or hexaalkylguanidinium bromide.

Specification page 5, line 7 to page 7, line 20.

Additionally, the attention of the PTO is respectfully directed to the further extensive specification disclosure of "goals" of the invention method, meanings of the information, distinctions between a first population of mixtures," how the genetic algorithm (GA) information is used and the standards that can be used to select a next population at page 1, line 5 to page 3, line 4, page 3, line7 to page 4, line 1, page 4, line 10 to page 5, line 6, the drawing figures and their accompany explanatory text in the specification at page 9, line 10 to page 11, line 23, the extensive examples appearing in the specification at page 12, line 1 to page 17, line 13.

35 U.S.C. §112, first paragraph states that "the specification shall contain a

written description of the invention, and of the manner and process of making and using it ... to enable any person skilled in the art... to make and use the same...." The PTO is respectfully requested to withdraw the rejection or explain why the extensive specification teachings and examples fail to teach the invention and "the manner and process of making and using it." to one skilled in the art. *See In re Brana,* 34 USPQ 2d 1436 (Fed. Cir. 1995) quoting *In re Marzocchi*, 439 F.2d at page 223, 169 USPQ at page 169 with approval at page 1441.

Claims 1 to 33 and 40 were rejected under 35 U.S.C. §112, second paragraph.

Claims 1, 11, 22 and 40 are amended to address the Office Action "population of entities" distinction-bases of rejection. Support for the amendments is found in the Examples and otherwise throughout the specification.

The Office Action states that "first population of entities," "second population of entities," "third population of entities" and "a fit entity" are vague and indefinite. But, it is well known that a "population" is "[a] specified set of objects or outcomes to be measured or observed," McGraw-Hill Dictionary of Scientific and Technical Terms, 5th Ed., p 1548 (1994) and that an "entity" is "something that has separate and distinct existence and objective or conceptual reality," Merriam Webster's Collegiate Dictionary, 10th Ed., p. 387 (1993) and that "fitness" is a measure of reproductive success," and is a term commonly used the GA art. McGraw-Hill Dictionary of Scientific and Technical Terms, 5th Ed., p 763 (1994). All of these terms are well known in the GA art. See for example, Wagner, Pat. 6,035,246 and Koza, Pat. 4,935,877. Additionally, the meaning of the terms is evident to one skilled in the art from the Examples[1] and context of the use of the terms in the specification. These bases of the 35 U.S.C. §112, second paragraph rejection should be withdrawn.

Claims 13 and 14 are canceled to overcome the "essentially independent" 35 U.S.C. §112, second paragraph basis for rejection. The claims have been amended to otherwise address the 35 U.S.C. §112, second paragraph bases of rejection relating to the

1 In the examples, fitness is determined by catalyst TON and the entities are successively improved catalyst TON.

claim preambles and claim 40 final step.

The rejection of claims 1 to 33 and 40 under 35 U.S.C. §112, second paragraph should be withdrawn.

.Claims 1 to 12, 14 to 16 and 22 to 28 were rejected under 35 U.S.C. §102(b) over Singh et al.

The rejection of claims 1 to 21 should be withdrawn. Claim 1 has been amended to further clarify that (1) catalytic mixture entities are formed and (2) the formed mixture entities are detected for catalytic activity. Singh et al. forms peptides on a support. The Office Action page 7 argues that the peptides on a support are "mixture" entities.

However first, the peptides at the time they are tested are single compounds – not "catalytic mixture entities."

Second, the peptides are tested for fluorescence with a Stromelysin protease array. The Office Action page 7 acknowledges that the fluorescence indicates "amount of catalytic activity by stromelysin." But, the fluorescence does not detect "catalytic activity" of the "formed mixture entities."

Singh et al. does not teach or suggest (1) "forming catalytic mixture entities" and does not teach or suggest (2) detecting a catalytic property of each of said mixture entities." The rejection of claims 1 to 12, 14 to 16 and 22 to 28 under 35 U.S.C. §102(b) over Singh et al. should be withdrawn.

Claim 13 was not rejected over Singh et al. New independent claim 61 is the same as claim 1 rewritten to incorporate limitations of claim 13. Claim 61 should be allowable. Claims 62 to 79 depend from claim 61 and similarly should be allowable.

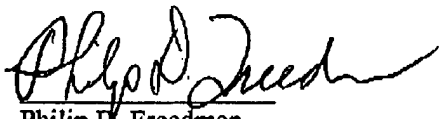
Claim 29 was not rejected over Singh et al. Independent claim 22 has been rewritten to incorporate the limitations of claim 29. Claim 22 should be allowable. Claims 23 to 27 and 30 to 33 depend from claim 22.and similarly should be allowable.

New claims 42 to 60 depend from claim 40, which was not rejected over Singh et al. Hence claims 40 and 42 to 60 should be allowable.

In view of the foregoing amendments and remarks, it is respectfully submitted that claims 1 to 27, 30 to 33, 40 and 42 to 79 are allowable. The non-elected claims have been canceled. Hence, reconsideration and allowance are requested.

Should the Examiner believe that any further action is necessary in order to place this application in condition for allowance, he is requested to contact the undersigned at the telephone number listed below.

Respectfully submitted,



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